

The Use Of A Clinical Case Study In A Clinical Information System Selection Process

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ABSTRACT

The University of Pennsylvania Health System recently underwent an extensive selection process for a new clinical information system. In addition to a traditional system selection approach, a clinical case study was utilized during our selection process. This was done in an effort to better prepare the clinicians involved in the selection process, as well as to help identify key operational issues that the institution would need to resolve, related to the design and implementation of a new clinical system. We will describe here the reasons this approach was chosen, how the case study was utilized, and provide an assessment of its usefulness.

INTRODUCTION

Healthcare reform will be one of the major public policy initiatives for the decade of the 1990's. The combination of legislative initiatives and healthcare marketplace evolution will result in a changing delivery system for patient care services. Provider organizations will be required to provide detailed information on cost and quality to payors and patients. Clinical information systems which support orders management, results management, clinical documentation, clinical decision support and access to external expert information will be the basis for delivering cost effective patient care while enhancing the quality of clinical services. In response to these demands many provider organizations will be implementing clinical information systems during this decade. Optimal benefits from

these systems can be best accomplished if collaborative practice paradigms are developed and extensive clinician utilization is achieved. To select a clinical system which will support integrated practice it is important that provider organizations use evaluation tools during the selection process that identify their clinical processes. Traditionally healthcare institutions have used lists of functional and technical requirements to assess information system capabilities. To more accurately identify clinical process requirements, The University of Pennsylvania Health System (UPHS) utilized a clinical case model to assess its clinical information system needs.

BACKGROUND

Much has been written in the last decade about the need to involve clinicians in the clinical information systems selection and implementation process. In a study that elicited over 600 physician's attitudes toward computer use, Anderson et al. (1) concluded that direct physician involvement in the design and implementation of clinical systems is essential to successful system implementation and utilization. Kovner et al. (2) advises in a recent review of project outcomes of the New Jersey Department of Health Nursing Incentive Reimbursement Awards (NIRA) that nurses selecting information systems should thoroughly

investigate potential systems and be cautious about vendor's promises. There has, however, been very little written in the literature to provide clinicians with a model to guide their clinical system selection process.

In reviewing nursing's involvement in the design and implementation process of a medical information system at the Clinical Center of the National Institutes of Health (NIH), Romano (3) recommends that the healthcare professionals who will be using the system identify required system functions, as well as general system characteristics. She goes on to identify some of the functionality that clinicians typically need to have. Thompson (4), in an evaluation of a selection process of a Hospital Information System (HIS), reports that Manfredi and Peterson (5) consider the acquisition of software for a hospital as a matter of life and death because of the critical nature of the operations involved. They uphold that the selection process must be done in a clear and organized manner. Ginsburg and Caretta (6) maintain that the development of a checklist of system requirements should play a major part in the selection planning process. Groom and Harris (7) utilize the concept of a clinical case study in their discussion on clinical operations automation, which focuses on the selection of data acquisition devices to support clinical operations. While they use a case study concept to help highlight the operational needs, they fall short in not recommending that such an approach can drive the system selection process.

The Case Study Development Process

APPROACH

The decision to use a clinical case study approach in the system selection process at

UPHS was driven by two primary objectives. The first was to ensure that the clinical system vendor demonstrations adequately and fairly represented each clinical system being presented by the vendors. This was important because of the lack of clinical systems experience amongst the clinicians at UPHS. It was necessary to make sure that the clinical users would be able to make a fair comparison between each vendor system. The second objective in using a case study approach was to begin educating the clinical users in understanding what a clinical information system was, and to begin identifying the operational changes that would result from the process of implementing a clinical system. In order to achieve these objectives a clinical case study that represented a typical day at the medical center was developed.

The case study begins early one morning with an attending physician in his office printing out his inpatient census from the clinical information system. Before he leaves for the hospital, the physician proceeds to view the most recent clinical data on his patients, including laboratory and radiology results, and current medication orders.

Meanwhile, at the hospital, nurses are using computer generated printouts from the clinical system in their morning report. After report, the nurse manager on one unit goes to the clinical system to check the unit census. Another nurse accesses the system to enter an admission assessment on a new patient. On arrival at the hospital the physician enters a number of orders in the clinical system on a patient who has suddenly deteriorated. During this process the physician is alerted by the clinical system of a drug allergy that the patient has, and of the need to get clearance by the Infectious Disease service for a restricted

antibiotic. The nurse caring for the patient receives the printout of new orders before the physician arrives on the unit and begins to act upon them. On arrival to the unit the physician confers with the resident on his service about the patient's condition and additional studies that are indicated. The resident then proceeds to access the clinical system and enters a procedure note for a lumbar puncture he has performed. At the same time, the nurse caring for the patient enters a transfer note in the system, since a decision has been made to transfer the patient to the ICU. The attending goes on to see a new patient who was admitted during the night, first reviewing on-line the diagnostic studies that were performed, and the orders that were entered for the patient.

The clinical case study continues to follow patients and clinicians in the medical center throughout the remainder of the day. The overall intention being to help the clinicians evaluating the clinical systems gain an understanding of what they could and could not expect from a clinical information system. Particularly, with regard to the implications it would have in their daily practice.

IMPLEMENTATION

Three clinical information systems vendors were selected to demonstrate their system at UPHS. Several weeks prior to the scheduled demonstrations, each of the vendors were given copies of the clinical case study and specific instructions regarding the functionality they would be expected to demonstrate, as well as the output documents their system would need to generate. UPHS personnel met with vendor representatives from each of the vendor companies to review the demonstrations they had developed, and to make certain they understood the desired

outcome. The expectation set forth by UPHS required that each vendor begin their system demonstration with the UPHS case study. The system features and functions they used for the case study had to exist as currently available products. If they completed the case study demonstration within the allotted timeframe the vendor could then go on and show other functionality or future system enhancements. This helped to ensure that the UPHS evaluators saw the same situations demonstrated by each vendor, and could then evaluate each from the same frame of reference.

ASSESSMENT

Most system selection processes involve an approach whereby identified functional requirements are presented to the vendor in a request for proposal (RFP) document. The vendor responds back to the institution indicating the degree to which their system can meet the requirements. While such an approach can be very helpful in determining the functionality within a given system and in comparing functionality between two or more systems, it does little to help identify the operational issues that the institution will need to resolve. For example, at UPHS a traditional RFP process was also used in addition to the clinical case study. Functional requirements were compiled for the nursing, physician and ancillary components of the systems. Review of each vendor's responses revealed very little difference between the systems and did nothing to help illustrate potential operational changes that implementing a clinical information system would necessitate.

The clinical case study, however, when demonstrated by each system vendor helped to point out differences in functionality

between vendor systems, as well as bringing to light some potentially significant operational issues. One such example involved the entry of orders into the systems. All three of the vendor RFPs stated that this functionality was available in their system. The clinical case study, however, helped to identify capabilities which support the entry of defined order sets. The case study in turn helped us to define the institutional processes that are required to develop order sets supportive of collaborative practice.

In demonstrating the entry of orders that are necessary prior to a procedure being performed (prep orders), it became evident that one vendor system had a limitation of four prep orders per procedure, while the other vendors had no such limitation. Operationally this limitation was unacceptable and without the use of the case study probably would not have been identified in a standard vendor demonstration process.

Another operational issue that the case study identified involves the need to ensure that data is entered into the system in a timely manner, this is particularly true with regard to medication charting. It became clear through the use of the case study that clinicians need to be assured of being able to access accurate information within a reasonable timeframe, otherwise, their incentive to use the system will be greatly diminished.

Through the use of the case study we were able to see the impact that on line medication charting could have on a nurse's productivity. One system allowed for access to multiple patients, including being able to retrieve just those patients the nurse was assigned to, while documenting medications. In another system medication charting could

only be done by individual patient, which had the potential to significantly increase the time spent when charting on multiple patients.

CONCLUSION

The selection of a clinical information system is not an easy task. The traditional RFP process can be very helpful in defining a system's functional features, and has contractual value later during the vendor negotiation process. It is essential, however, that key operational issues be identified as early as possible in the system procurement process. Early issue identification can influence the final system decision, as well as provide opportunities in the system design and development phases to develop either technical or operational solutions. The use of a clinical case study in the clinical information system selection process can greatly facilitate the challenge of identifying the key operational issues within an institution. Issues that will significantly impact upon the ultimate success and acceptance of the system.

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